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# Adoption of Participatory Approach in Rural Water Supply Schemes in Sri Lanka

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**Abstract**

The drinking water issues has been a severe discourse everywhere in the world. Notably, rural communities have been suffered a lot due to lack of safe, affordable and quality drinking water in many developing nations, including Sri Lanka. The government of Sri Lanka has adopted a participatory approach as a useful strategy to provide drinking water service to rural people. Approximately 4,717 CBO managed rural water supply schemes have been functioning throughout the country. Thus, this study was aimed to evaluate the adoption of participatory method in rural drinking water projects. This study used Robert Chambers' - *'putting the last first'* theory which has applied to examine how rural water supply systems have been adopted participation of local communities in the RWS schemes. The combinations of qualitative and quantitative methods were employed in this study based on the secondary data such as government's statistical report and resource profiles of the community water department and National Water Supply and Drainage Board. The study observed that participatory approach has taken into account in the RWS schemes in Sri Lanka, as a possible and alternative method to operate the service units with the support of government and the financial assistance of donor agencies. Yet, this study found that although CBO-managed rural water supply schemes have been implemented with the adoption of community members in the initial stage of project implementation, however, it was revealed that a significant number of these CBO schemes have not been sustainable, due to environmental, social, economic, technical and institutional factors that need to be addressed and mitigated by the respective stakeholders.

**Keywords:** Community participation, CBOs, Participatory approach, Rural Water Supply (RWS)

## 1. Introduction

After independence in 1948, the Government of Sri Lanka (GOSL) had taken numerous efforts to provide drinking water facilities, especially, the Rural Water Supply activities were implemented at the divisional levels through the Local Authorities (Rural Water & Sanitation Section, RWSS; NWSDB, 2016). In the same period, the government constructed common dug wells and small scale pipe-borne water facilities to rural people. In Sri Lanka, the excessive engagement for rural drinking water service was initiated after the declaration of 'Global Water Decade' in 1980. Later, the National Water Supply and Drainage Board (NWSDB), state institutions and non-governmental organizations were taken many efforts to upgrade rural drinking water system consequently. As a result, it is quantified that there are 4,717 rural piped water supply schemes have been functioning throughout the country under various projects (Statistical Guide Book, RWS, 2017). These RWS schemes are being managed by the (CBO) beneficiary communities in rural sectors. Conversely, in some of the schemes, it has been observed that there are difficulties in its effective function and its sustainability too. Thus, after a long study, the action has been taken to establish the RWS section under the existing institutional arrangement of the NWSDB to ensure the sustainable function of current Rural Water Supply System in 23 districts at present (Rural Water & Sanitation Section, RWSS; NWSDB, 2016).

The government aimed to build capacity among the rural community (Community Based Organization - CBO) to increase the access to drinking water facilities by using (participatory model) demand-driven approach (Ariyabandu & Aheeyar, 2004) in Sri Lanka. Many CBOs are getting financial support from local authorities or donor agencies or the NWSDB where possible. Further, the Department of National Community Water Supply (DNCWS) was created in 2014 as the institution responsible for supporting CBOs. However, it is still in its beginning and lacks resources (The World Bank Report, 2017). In Sri Lanka, more than 40% of the rural inhabitants of over six million rural people do not have access to safe drinking water and adequate sanitation standard, in other words, 27% of Sri Lanka's population still suffers due to lack of safe drinking water supply facilities and 30% does not have access to adequate sanitation facilities (Ananda, 2011).

There was some participatory approach exercised in the rural drinking water sector in Sri Lanka, for the last three decades, to overcome the problems associated with rural drinking water and sanitation facilities. But many RWS projects are facing many problems, some of the projects or RWS schemes were abandoned at present. Therefore this paper aimed to evaluate the adoption of participatory approach in the RWS sectors and to exemplify the factors contributing to the dysfunction of RWS schemes, and, further, to identify the challenges faced by the CBO in operation and maintenance (O&M) of the RWS schemes in Sri Lanka.

### 1.1. Objectives

The main objective of this paper is to appraise the adoption of a participatory approach in the rural water sector in Sri Lanka, and to address the reasons contributing to the

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disuse of rural water schemes. Also, the paper aimed to identify the challenges faced by the CBOs in operation and maintenance of the rural water supply schemes in Sri Lanka.

## 2. Materials and Methods

The study focuses on RWS schemes which were established in Sri Lanka. The Fig. 1 shows the Provincial map of the country. Provincial Map of Sri Lanka The total number of population in Sri Lanka is 20,359,439 (Census & Statistic Report, 2012). And the total number of households 5,192,498, out of that 742,490 households are having water supply connection. According to this 2,845,098 beneficiaries are enjoyed with drinking water service. The island rural water supply coverage is only 14%. The total Grama Niladhari Divisions (GNDs) consist of 14,021 (100%), and out of that only 4,038 (28.8%) GNDs having the water supply schemes, where 4,717 RWS schemes were established by the government with the support of other institutions and donor agencies (Statistical Guide Book, RWS, 2017). To identify the RWS or CBO managed water supply schemes, and to assess the participatory approach in the schemes, the following methods were used in this study. The combinations of qualitative and quantitative methods were employed in this study based on the secondary data such as government's statistical report and resource profiles of the community water department. Data were analysed using thematic data analysis for a comprehensive understanding of factors contributing to the rural drinking sectors in the country.

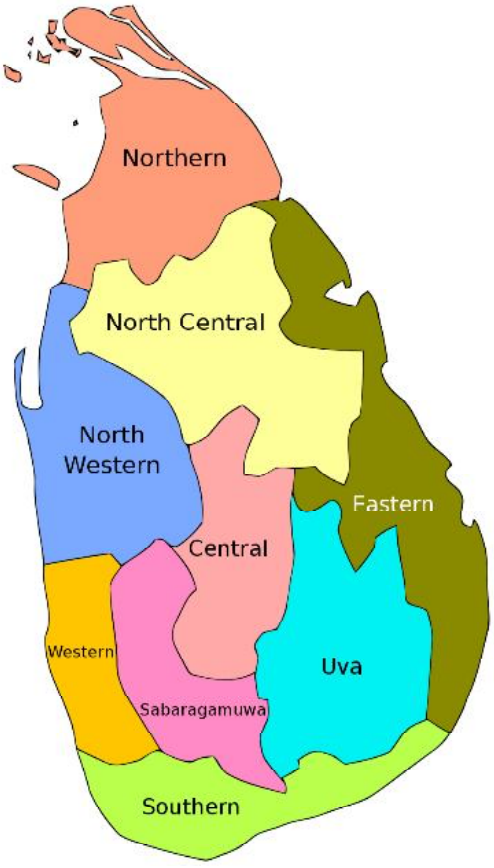


**Fig. 1.** Provincial map of Sri Lanka

## 3. Review of Participatory Approach

Different types of participatory approaches had been adopted in the rural water supply systems across the countries. Bradley and Karunadasa (1989) pointed out that an integrated community participation approach is a useful and sustainable method for the rural drinking water system (Bradley *et al.* 1989). The traditional participatory approach, i.e. *'top-down approach'* or 'supply-driven approach was adopted in the rural water supply projects in the early decades in many countries including India, Kenya, Ghana, Bangladesh and Sri Lanka, and it has been transformed from traditional to *'bottom-up'* or *'demand-driven approach'* (Juan *et al.* 2002, Ediriweera 2005, Wakeman, 2008, Waithaka, *et al.* 2016, Luis *et al.* 2017 & Lalith *et al.* 2019. According to Juan and Afamia (2002), the demand-responsive or bottom-top participatory approach is an innovative community participation strategy for water supply projects. Luis et al. (2017) highlighted the 'demand-responsive approach' (DRA) had been adopted after 2008 in 'JALANIDHI'*project which has been adopted) in the state of Kerala, India (Luis *et al.* 2017). The participation of the local community or people-centred approach is required by all stakeholders everywhere in connection with a rural water supply and sanitation projects. It was suggested that a *'community-centred' or 'community-based* and *'demand-driven'* approach is most suitable and recognized model to ensure the success and sustainability of drinking water project in Sri Lanka (Ediriweera, 2005).

The community-managed water supply systems are mostly operated by the CBOs in many rural regions, as Silva (2018) and Bradley *et al.* (1989) stated that CBO participation is a core of the water supply system in Sri Lanka. The government hopes to reach this target, with the assistance of the private sector and CBOs, by promoting DRA as an instrument to improve efficiency and sustainability while targeting the poor more effectively (Ariyabandu *et al.* 2004). Most of the pipe-borne RWSS operated under the participatory approach and managed by CBOs. Thus this study, particularly, applied Robert Chambers' theory of *'putting the last first'*, (Michael, 1985:516-517 & Robert, 1983 & 1997) to evaluate the adoption of participatory approach in the RWS schemes in Sri Lanka. 'Putting the last first approach' requires stronger policies from institutions to assist poorer in a strong and sustainable manner. This approach invites the greater involvement of local community through application of participatory rural appraisal (PRA). This theory also recommends the bottom-up (DRA) approach as a development model to achieve communal goals.

[*Jalanidhi is a rural water supply project which has been implemented by the Government of Kerala, funded by the World Bank. This reformation policy adopted by the government to adhere the demand-responsive approach in the rural water sector. This project promotes sustainability and community ownership through participatory operation and maintenance].

## 4. Results and Discussion

There are no proper agencies like NWSDB to provide piped-borne drinking water supply to the urban and estate sector. While the Ministry of City Planning and Water Supply has primary responsibility for guiding rural water supply, until the establishment of the National Community Water Trust (NCWT) in 2011, there was no single unit or department tasked with managing the rural water supply sector (The World Bank Report, 2017). According to the WB report, in 2014, the NCWT was replaced by the Department of National Community Water Supply (DNCWS), recognized within the Ministry of City Planning and Water Supply, as the nodal agency with prime responsibility for rural water supply.

Generally, the rural water supply service is handled by a large numbers of community-based organizations that operate and maintain rural water supply facilities in the village level. In addition to the DNCWS, these CBOs are supported by the NWSDB's regional support centres (RSC) and other local government authorities (Pradesiya Sabha) that provide technical and managerial support to CBOs (The World Bank Report, 2017). The following spectrum summarizes the institutional structure for rural water supply system.

In 2001, the GOSL, adopted the National Policy for the RWSS Sector. Key objectives of the policy include *(i)* demand-responsive and participatory approaches to water service delivery and *(ii)* beneficiary contributions to the capital costs and full responsibility for operation and maintenance (O&M). The policy marks clearly that water service delivery is the responsibility of the communities themselves and allocates a supervisory, monitoring, and technical support and capacity development role to provincial and local authorities (Ministry of Urban Development, Sri Lanka, 2001). The RWS schemes are being functioned in 23 districts, out of 25 administrative districts in Sri Lanka. It covers 4,717 RWS units in various villages in nine provinces. The total no. of GNDs, details of RWS schemes and numbers of water connections have been quantified in the Table 1.

According to the above data, it has been observed that there are different numbers of RWS schemes and water connections represent in the different region on the basis of the district, province and GNDs level, which can be categorized in Table 2, 3 and 4.

When cross-tabulate the above information, Northern Province has been as a vulnerable zone regarding the RWS scheme operation. Though, all RWS schemes were adopted

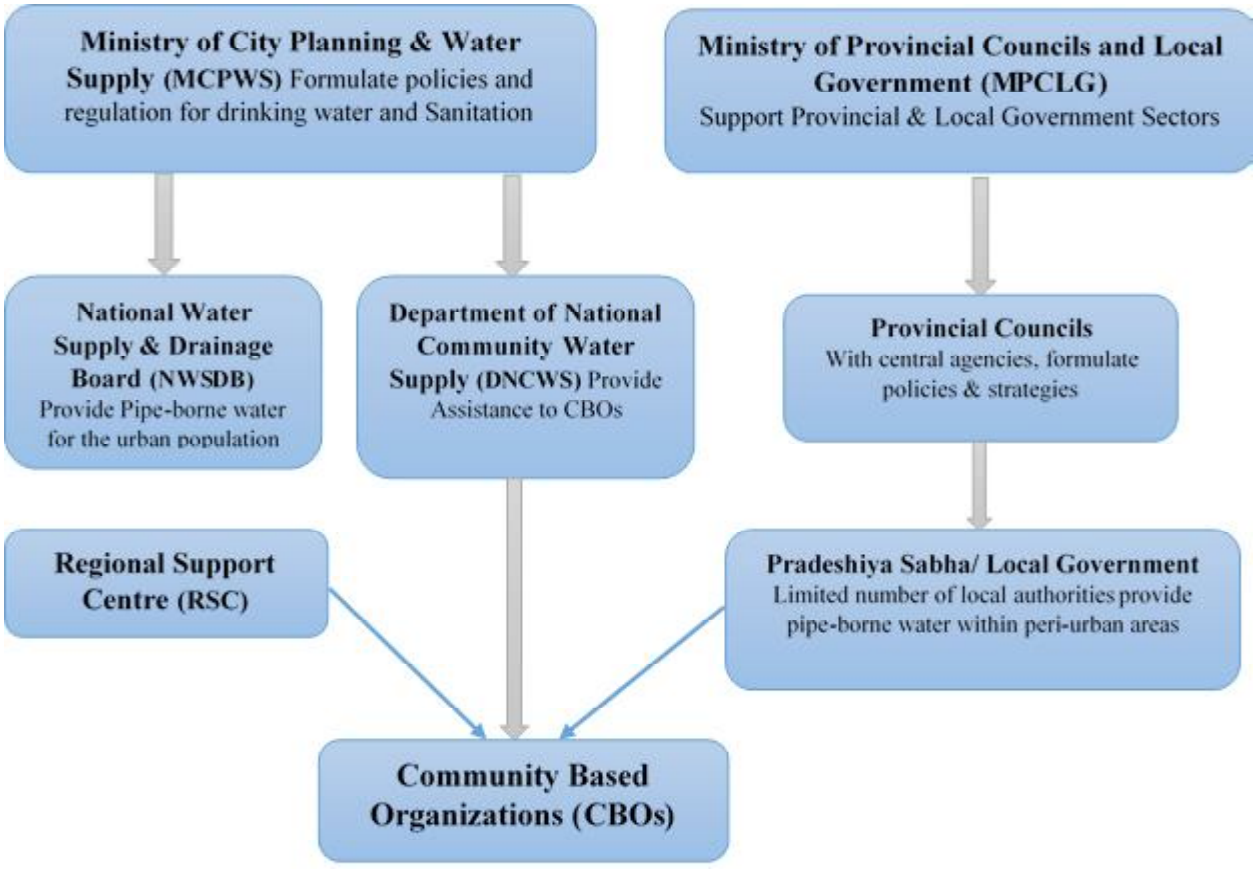


**Fig. 2.** Institutional Structure of RWS

Source: The World Bank. PPA Report - Sri Lanka, 2017 & Statistical Guide Book, RWS, NWSDB, 2017.
Note: Arrows represent bureaucratic or supervisory protocol.

**Table 1.** Rural Water Supply Schemes in Sri Lanka

| Provinces | Districts Schemes | RWS Connections | No. of | No. of GNDs | No. of GND having RWS |
|---|---|---|---|---|---|
| Sabaragamuwa | Ratnapura | 416 | 82,821 | 575 | 352 (61.2) |
| | Kegalle | 267 | 32,642 | 573 | 206 (36.0) |
| Uva | Badulla | 520 | 52,818 | 567 | 417 (73.5) |
| | Moneragala | 131 | 22,457 | 319 | 119 (37.3) |
| Eastern | Batticaloa | 19 | 3,018 | 346 | 17 (4.9) |
| | Ampara | 64 | 17,986 | 503 | 53 (10.5) |
| | Trincomalee | 38 | 8,363 | 230 | 36 (15.7) |
| Southern | Galle | 168 | 7,517 | 895 | 120 (13.4) |
| | Matara | 550 | 45,299 | 650 | 435 (66.9) |
| | Hambantota | 184 | 53,259 | 576 | 255 (44.3) |
| Central | Kandy | 215 | 32,272 | 1,187 | 236 (19.9) |
| | Matala | 226 | 39,682 | 545 | 255 (46.8) |
| | Nuwara-Eliya | 127 | 21,835 | 491 | 127 (25.9) |
| North Western | Kurunegala | 538 | 73,524 | 1,610 | 519 (32.2) |
| | Puttalam | 134 | 44,677 | 548 | 135 (24.6) |
| North Central | Anuradhapura | 287 | 65,078 | 694 | 237 (34.1) |
| | Polonnaruwa | 275 | 49,818 | 295 | - |
| Northern | Jaffna | 3 | 613 | 435 | 8 (1.8) |
| | Mannar | 6 | 1,229 | 153 | 6 (3.9) |
| | Vavuniya | - | - | 102 | - |
| | Mullaitivu | - | - | 136 | 2 (1.5) |
| | Kilinochchi | 5 | 1,086 | 95 | 5 (5.3) |
| Western | Colombo | 175 | 25,973 | 557 | 129 (23.2) |
| | Gampaha | 208 | 41,337 | 1,177 | 202 (17.2) |
| | Kalutara | 161 | 19,186 | 762 | 167 (21.9) |
| **Total** | | **4,717** | **7,42,490** | **14,021** | **4,038** |

**Source**: Statistical Guide Book, RWS Section, NWSDB, Sri Lanka, 2017

**Table 2.** Rural Water Schemes in Sri Lanka

| Status | Province | District | No. of Schemes |
|---|---|---|---|
| | Southern | Matara | 550 |
| Higher | N-Western | Kurunegala | 538 |
| | Uva | Badulla | 520 |
| | Northern | Mannar | 6 |
| Lower | Northern | Kilinochchi | 5 |
| | Northern | Jaffna | 3 |

**Table 3.** Connection Details of Rural Water Schemes in Sri Lanka

| Status | Province | District | No. of connections |
|---|---|---|---|
| | SAB | Ratnapura | 82,821 |
| Higher | N-Western | Kurunegala | 73,524 |
| | N-Central | A'Pura | 65,078 |
| | Northern | Mannar | 1,229 |
| Lower | Northern | Kilinochchi | 1,086 |
| | Northern | Jaffna | 613 |

**Table 4.** Rural Water Schemes in Grama Niladhari Divisions

| Status | Province | District | GNDs | % |
|---|---|---|---|---|
| | Uva | Badulla | 417 (567) | 73.5 |
| Higher | Southern | Matara | 435 (650) | 66.9 |
| | SAB | Ratnapura | 352 (575) | 61.2 |
| | Northern | Mannar | 6 (153) | 3.9 |
| Lower | Northern | Kilinochchi | 5 (95) | 5.3 |
| | Northern | Mullaitivu | 2 (136) | 1.5 |

**Table 2, 3 & 4 Source**: Statistical Handbook, RWS Section, NWSDB, Sri Lanka, 2017

**Table 5.** Water Sources Used by RWS Schemes in Sri Lanka

| Categorization of Schemes by Source of Water | Nos. | % |
|---|---|---|
| Deep Ground Water | 337 | 7.1 |
| Deep Ground Water/Shallow Ground Water | 55 | 1.2 |
| Deep Ground Water/Spring Water | 3 | 0.1 |
| Bulk Supply (Full) | 62 | 1.3 |
| Bulk Supply (Partial) | 23 | 0.5 |
| Reservoir | 46 | 1 |
| Shallow Ground Water | 1,167 | 24.7 |
| Shallow Ground Water/Spring Water | 26 | 0.6 |
| Shallow Ground Water/Surface Water | 15 | 0.3 |
| Spring Water | 420 | 8.9 |
| Surface Water | 304 | 6.4 |
| Surface Water/Spring Water | 3 | 0.06 |
| **Total** | **2,461** | **52.2** |

**Source**: RWS Section, NWSDB, Sri Lanka, 2017

participatory approach and function with the support of CBOs in village level. The RWS use water from various source to operate and provide service to the local communities. Table 5 shows the details of the water source utilized by most of the RWS schemes in Sri Lanka.

Based on the Tables (1, 2, 3, 4 & 5), we have understood that the details of RWS schemes established all over the island, and how water sources utilized by the RWS schemes and observed the higher and lower level analysis of the water connections in the regional aspects across the country. However, the total distribution length of all

RWS schemes has quantified 9,460.4 km. The daily water production from all schemes has valued (cu.m.) 1,087,520 $M^3$ and, the cost spent for RWS schemes has estimated (LKR) 35,260.8 million for providing safe and affordable drinking water to the rural communities in Sri Lanka (Statistical Guide Book, RWS, 2017).

Many rural drinking water projects were implemented in Sri Lanka, funded by the World Bank, and Asian Development Bank, and these donors were taken many steps to deal with drinking water issues and to ensure the sustainability of those projects in the village sectors in the country. The World Bank-funded Community Water Supply Projects (CWSP) were implemented by the CWSP unit or Rural Water Supply and Sanitation (RWSS) division under the Ministry of Urban Development provided affordable drinking water and sanitation services to the rural sectors, particularly, in Ratnapura, Badulla and Matara districts (first stage 1993-1999), and Nuwara-Eliya, Kandy and Matale (Central Province) and Kurunegala in North-Western Province (second stage 2004-2009). This CWSSP was the turning point of RWS scheme in upholding 'people-centered' and 'Demand Driven' approach in the water sector in Sri Lanka historically (Ananda, 2011). This participatory model recognized the voluntary involvement of local beneficiaries (rural people) estimated over 30 per cent of the total capital expenditure, as it was mandatorily required 20 per cent of community contribution under CWSP.

The financial support has been given for RWS operation by various agencies and projects namely; ADB, AusAID, CWSSP, Gamaneguma, Gemidiriya, Ministry of Economic Development, NWSDB, Plan Sri Lanka, Plantation Human Development Trust, Pradhesiya Sabha, Rajarata Nawodaya, Samurdhi, UNICEF, JICA (Japan International Corporation Agency), World Vision and so on (Statistical Guide Book, RWS, 2017) in order to promote beneficiaries' participation (participatory approach) in their own project that need to promote long-term success and sustainability of the RWS system in the country. The NWSDB and donor agencies help the local people to form a CBO, give proper training and awareness to them, and then handover the projects in the hands of beneficiaries who will take part in the O&M of the project. The awareness campaign, funding and assistance to the local community, creating CBOs to prepare, design, monitor, and implement RWSS, and corporate with government, observe the other subprojects, provide training and capacity building to CBOs can be done by the donor agencies in order to enable them for handling the project effectively (The World Bank Report, 2017).

Michael Cernea (1985) argues that the need for putting people first is more and more clearly seen and felt, not just by social scientists but across the whole range of disciplines and departments. He exemplified the previous Malawi project; it said: "*This is not the government's water scheme; it is yours. It will only work if you are willing to work. And it is you, rather than the government, that will make the decision on whether to proceed, on organizing yourselves into committees, and on deciding the order in which various villages would participate" (Michael Cernea, 1985).*

Robert Chambers (1983 & 1997) stated that sustainability, development and empowerment are interconnected with each other and invite involvement of rural community to share their knowledge. Putting people first, and putting the poorer, first of all, is now more than ever a matter of personal, and professional choices and commitment. So, *putting the last first approach* requires strong policies and institutional support to assist poorer, through application of participatory rural appraisal (Robert, 1983; 1997 & Michael, 1985). The participatory approach used in the RWS schemes as a key strategy to operate and manage the rural drinking water supply service in Sri Lanka, under the RWSS/DCWSS, with the overall observation of the NWSDB. Participatory approach for RWS initiation was accepted to adopt in Sri Lanka for the last few decades (Ananda, 2011). This model or strategy primarily focused on 'participatory approach' which offer the opportunity for local people (real and direct beneficiaries) to take part in making decisions at all stage of the project and its implementation. Hence, the participatory approach encouraged the sense of community ownership in the RWS system through social mobilization, ensure community decision making, planning and designing the participatory models, and management of RWS schemes towards sustainability of the project implemented in all rural water sectors in Sri Lanka.

**Challenges of CBOs in RWS Schemes**

Most of the CBOs have financial, technical, and organizational sustainability challenges. The technical challenges are liable to repair the water pump and the contamination of drinking water. Some technical issue can be attempted by CBOs themselves, but other CBOs are not capable enough to handle that issue. Fewer CBOs are economically sustainable based on a larger number of water connection, many are hardly surviving. Though access to an improved water supply is relatively high at the country level, water service levels in urban and rural areas have been quite uneven. In urban areas, the population with access to piped water increased from 52 per cent in 2000 to 73 per cent in 2015, while a rural population with access to piped water was only 14 per cent in 2000 and it is still as low as 25 per cent in 2015 (The World Bank Report, 2017).

- The institutional procedure has been unclear to support community-based organizations.
- An unclear system for tracking the results or outcomes of the service distribution
- Participatory approach exercised in the initial stages, and many (economic, environmental and social) factors contributed to abandoning the schemes.
- Due to the limited water availability for extraction by the source available to distribute water to all the people in the village became a serious issue.
- The RWS scheme had been running on a groundwater source, and its yield was not enough.
- High electricity costs involved with water extraction from the shallow well and limited water supply of the scheme is also an issue.

• No proper coordination found between donors and respective state water agency so that RWS scheme failed.
• Dug well water has been contaminated from expanding agricultural uses and climate changes, seasonal droughts and so on.
• People's time, money, and energy have been spent on fetching water.
• It has deprived of their labor productivity and economic output.
• Management of water supply facilities having unclear policy among RWS constructed schemes.
• No clear guidelines for designing the procedures to ensure sustainable nature of rural water supply system.
• No proper guideline to form a strategy to compact with issues related to administration of project operation. This is saying that a numerous amenities provided flattering neglected or abandoned, it is making them ineffective in succeeding with its intended objectives (Ananda, 2011).

## 5. Conclusion

It has been noticed that the CWSSP and RWSSP were evidently focused on adopting a participatory model in the projects. These projects have received a greater contribution from local communities in terms of CBOs involvement, and financial assistance gained through donors from both local agencies and international organizations including WB, ADB and UNICEF etc. These all stockholders were targeted to adopt participatory model or demand-driven approach in the RWS Schemes for providing quality and uninterrupted drinking water supply service to the rural communities. To achieve this goal, CBOs were trained, and local people ensured their engagement in operation and maintenance of those projects. In fact, the involvement of beneficiaries from grass-root level was a key participatory strategy to construct and operate RWS schemes with ownership of CBOs in the water sectors. The investment, contribution and involvement in water facilities create a sense of ownership among beneficiaries. The CBOs are functioning in many villages and handling the water scheme in a successful and sustainable manner. However, most of the CBOs face numbers of technical, institutional, environmental, and social problems during the implementation of RWS system in rural sectors in the country. To overcome these issues, this paper provides some suggestions such as, enhance water productivity by implementing a properly functioning rural water supply system based on participatory development approach; creating more awareness on protecting and restoring the ecosystems; introduce rainwater harvesting as alternative mechanism, educate on best water practice and water conservation; and promote rain water collection and measures to improve the efficiency of water use at household level in the rural sectors in Sri Lanka to ensure the sustainable function of RWS schemes.

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## 6. References

Ananda Dissanayake, D. M. U. L. 2011. Sustainable Water Management focused RWS Models in Sri Lanka. *World Water Congress Proceeding*. International Water Resource Association (IWRA). France. Paris. Retrieved from: https://www.iwra.org/member/congress/resource/PAP00-4855.pdf

Ariyabandu R. De S. and M.M.M. Aheeyar. 2004. Secure Water Through Demand Responsive Approaches The Sri Lankan Experience. Overseas Development Institute. Department for International Development (DFID). United Kingdom (UK). London. Retrieved from: http://www.securewater.org

Bradley, R.M. & Karunadasa H.I. 1989. Community Participation in the Water Supply Sector in Sri Lanka. *Journal of the Royal Society of Health (JRSH).* 1989(4): 131-136. Sage Publishers. DOI: https://doi.org/10.1177%2F146642408910900407

Census & Statistic Report. 2012. Census of Population and Housing Sri Lanka 2012. Department of Census and Statistics. Ministry of Finance and Planning. Sri Lanka. Colombo. Available at: www.statistics.gov.lk

Ediriweera, I.V.W. 2005. Strategies adopted for sustained water supply and sanitation through community participation in Sri Lanka. 31st WEDC International Conference on Maximizing the Benefits from Water and Environmental Sanitation. Uganda. Kampala.

Juan D. Gomez and Afamia C. Nakat. 2002. Community Participation in Water and Sanitation.. *Water International Journal*. 27(3): 343-353. International Water Resources Association. DOI: 10.1080/02508060208687014

Lalith Wijesinghe, Darshani Ilangangedara, Gunarathne, L.H.P. 2019. Sustainable Rural Water Supply Schemes and Sri Lankan Community-based Organizations. *Indian Journal of Public Administration*. 65(3): 702-717. SAGE. DOI: 10.1177/0019556119840924

Luis Andres, Saubhik Deb, Martin Gambrill, Elisa Giannone, George Joseph, Pramod Kannath, Manish Kumar, P.K. Kurian, Rajesh Many and Abdu Muwonge. April 2017. Sustainability of Demand Responsive Approaches to Rural Water Supply: The Case of Kerala. Policy Research Working Paper. Water Global Practice Group. The World Bank Group. Retrieved from: https://www.researchgate.net/publication/324091829 (ResearchGate)

Michael Cernea (Eds.). 1985. *Putting People First: Sociological Variables for Rural Development.* The World Bank Publication. Oxford University Press.

Ministry of Urban Development. 2001. Construction and Public Utilities. National Policy for Rural Water Supply & Sanitation Sector. Sri Lanka. Battaramulla.

Robert Chambers. 1983. *Rural Development: Putting the Last First*. Longman. Scientific and Technical. USA. New York.

Robert Chambers. 1997. *Who Reality Counts? Putting the First Last*. London. Intermediate Technology Publications.

Rural Water & Sanitation Section. Feb 3, 2016. National Water Supply & Drainage Board (NWSDB). Sri Lanka. Retrieved from: https://nwsdbrws.org/wp/

Silva De. P.K.W. 2018. Alternative Management Models in Small Town Water Supply Schemes in Sri Lanka. In: *Management models for piped water supply services: a decision-making resource for rural and small-town contexts*. Water Aid & Agua consult Publication. Retrieved from: https://www.iwra.org/member/congress/resource/PAP00-4813.pdf

Statistical Guide Book. Sep 2017. Community Operated Water Supply Scheme. Rural Water and Sanitation Section. National Water Supply & Drainage Board (NWSDB). Sri Lanka. Ratmalana.

The World Bank Report. June 26, 2017. Project Performance Assessment Report – Sri Lanka (Report No.:115781). Second Community Water Supply and Sanitation Project (CH035). Independent Evaluation Group (IEG). The World Bank Group.

Waithaka, A., Kisovi, L.M. And Obando, J. 2016. The Impact of Community Participation in Rural Water Management in Ndarugu-Thiririka Sub-Catchment, Athi Basin, Kenya. *Ethiopian Journal of Environmental Studies & Management*. 9(2): 245-254. DOI: http://dx.doi.org/10.4314/ejesm.v9i2. 12

Wakeman. 2008. How well is the Demand-Driven Community Management Model for Rural Water Supply Systems Doing? Evidence from Bolivia, Peru, and Ghana. Working Paper 22. Brooks World Poverty Institute. The University of Manchester.